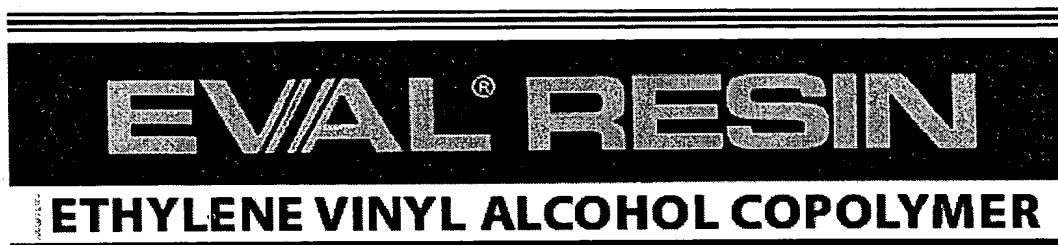


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## ATTACHMENT

09753630-010201



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01/02/01

**E151B**

**44 mol % ETHYLENE\***

**High Barrier Resin for Multilayer Barrier Structur**

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**PROPERTIES:**

- HIGH GAS BARRIER
- EXCELLENT FORMABILITY
- EXCELLENT ODOR AND AROMA BARRIER
- EXCELLENT PROCESS ABILITY
- FDA COMPLIANCE

**APPLICATIONS:**

EVAL® E151B resin is excellent material for cast coextrusion and coextrusion coating application. It also provides deep draw forming capability for both melt and solid phase thermoforming applications. E151B resin provides very good oxygen barrier properties at high relative humidity as well as good recyclability.

**CERTIFICATIONS:**

EVAL® resins may be used in applications involving direct food contact as outlined by the Food Administration regulations, 21 CFR, Section 177.1360. EVAL® resins may be used for indirect (adhesive resins) as outlined in CFR, Section 175.105.

EVAL® resins comply with food additive regulations covering material used for the packaging of under retort conditions.

EVAL® resins meet the requirements of the U. S. Department of Agriculture and the Canadian M Agriculture for use in contact with meat and poultry products.

## FABRICATION TECHNIQUES:

Suggested extrusion conditions are as follows:

Extruder Barrel Temperature, °C

Adapter Temperature: 195

C<sub>1</sub>:170

Die Temperature: 195

C<sub>2</sub>:190

C<sub>3</sub>:195

C<sub>4</sub>:205

C<sub>5</sub>:210

\*Ethylene incorporated

## TYPICAL PROPERTIES

PROPERTY	TEST METHOD	VALUE
<b>RESIN</b>		
Melt Index, g/10 min @ 190°C, 2160g	ASTM D1238	1.6
210°C, 2160g		3.5
Density, g/cc	ASTM D1505	1.14
Melting Point, °C	DSC	165
Crystallization Temperature, °C	DSC	142
Glass Transition Point, °C	Dynamic Viscoelasticity	55
Extruder Melt Temperature Range, °C	—————	185-250

<b>FILM</b>		
Oxygen Permeability	ASTM D1434	
cc.mil/100 in <sup>2</sup> /24 hrs./atm@ 65% RH, 68°F		0.08
cc.cm/cm <sup>2</sup> sec.cm Hg@ 65% RH, 20°C		4.0x10 <sup>-14</sup>
Carbon Dioxide Permeability	ASTM D1434	
cc.mil/100 in <sup>2</sup> /24 hrs./atm@ 65% RH, 68°F		0.20
cc.cm/cm <sup>2</sup> sec.cm Hg@ 65% RH, 20°C		1.2x10 <sup>-14</sup>
Water Vapor Transmission Rate	ASTM E96-E	
g.mil/100 in <sup>2</sup> /24 hrs. @ 90% RH, 100°F		1.4
g.30μ/m <sup>2</sup> /24 hrs. @ 90% RH, 40°C		19
Gloss, 45°	ASTM D2457	85
Haze, %	ASTM D1003	1.7
Ultimate Tensile Strength, psi	ASTM D882	7400
Ultimate Elongation, %	ASTM D882	280

Nothing contained herein is to be construed as a recommendation to use any product in conflict with any patent. **EVAL COMPANY OF AMERICA MAKES NO WARRANTIES AS TO THE FITNESS OR MERCHANTABILITY OF ANY PRODUCTS REFERRED TO**, no guarantee of satisfactory results from reliance upon contained information or recommendations, and disclaims all liability for any resulting loss or damage.

# EVAL<sup>®</sup> RESIN

## MATERIAL SAFETY DATA SHEET

MATERIAL SAFETY DATA SHEET  
EVAL COMPANY OF AMERICA (EVALCA)  
1001 WARRENVILLE ROAD (SUITE 201)  
LISLE, IL 60532-1301



NUMBER: EVALCA MSDS-EVAL01  
DATE: November 17, 2000

### EMERGENCY PHONE

EVALCA: (281) 474-1524

CHEMTREC: (800) 424-9300

### GENERAL INFORMATION

EVALCA: (630) 719-4610 (Monday through Friday, (9:00 a.m. to 5:00 p.m. Central Standard Time)

### SECTION I - IDENTIFICATION

#### PRODUCT:

E105A	E105B	E151A	E151B
F100A	F100B	F101A	F101B
F104A	F104B	G110A	G156B
H101A	H101B	HU101B	H171B
K102A	L101A	L101B	

SYNONYMS: Ethylene-vinyl acetate-vinyl alcohol copolymer

CAS RN: 26221-27-2

This product is not hazardous as defined by the U. S. Occupational Safety and Health Administration (OSHA) under its Hazard Communication Standard (HCS), 29 C.F.R. § 1910.1200.

### SECTION II - INGREDIENTS

COMPOSITION	CAS NO.	NOMINAL %	PEL/TLV	HAZARD
Ethylene-vinyl	26221-27-2	>99	None	None Noted

acetate-vinyl  
alcohol copolymer

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### SECTION III - HEALTH HAZARD INFORMATION

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INHALATION: Fumes may be generated in operations using heated polymer.

INGESTION: Not known.

EYE CONTACT: Powder or finely ground dust could cause eye irritation.

SKIN CONTACT: Molten or heated material can cause serious burns to unprotected skin.

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### SECTION IV - OCCUPATIONAL EXPOSURE LIMITS

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Listed as a carcinogen by: [no] NTP [no] IARC [no] OSHA: If any ingredient is listed by one of the three agencies as a carcinogen a "y" or "yes" is placed in the brackets; otherwise "n" or "no" is used.

PEL (OSHA Permissible Exposure Limit): No OSHA PEL for this compound. For nuisance dust: 15 mg/m<sup>3</sup> (respirable) - 8 hour TWA.

TLV (ACGIH Threshold Limit Value): No ACGIH TLV for this compound For nuisance dust: 10 mg/m<sup>3</sup> - 8 hour TWA.

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### SECTION V - EMERGENCY FIRST AID PROCEDURES

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#### FOR OVER EXPOSURE BY:

SWALLOWING: Call a physician or the Poison Control Center immediately.

SKIN CONTACT: Wash affected area with plenty of water.

INHALATION: If overcome by finely ground or heated fumes, immediately remove victim to fresh air. If victim has stopped breathing, give artificial respiration, preferably mouth to mouth. Get medical attention immediately.

EYE CONTACT: If finely ground dust gets in the eyes, immediately flush eyes with plenty of cool water to remove particles from eyes.

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### SECTION VI - PHYSICAL DATA

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RESIN DENSITY: 1.14 - 1.20 g/cc

BULK DENSITY: 34 - 47 lbs./ft<sup>3</sup>

SUPER HEAT: 0.57 cal/g/°C

MELTING POINT: 158 - 191 °C

VAPOR PRESSURE: Not applicable

HEAT OF COMBUSTION: 7,000 - 7900 cal/g

VAPOR DENSITY (AIR=1): Not applicable

SOLUBILITY IN WATER: Essentially none

**APPEARANCE AND COLOR:**

White to straw colored and colorless chip and pellet, odorless.

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**SECTION VII - FIRE AND EXPLOSION HAZARDS**

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**FLASH POINT AND METHOD USED:** 550°F (288°C) Cleveland Open Cup

**AUTO IGNITION TEMPERATURE:** Not applicable

**FLAMMABLE LIMITS IN AIR, % BY VOLUME LOWER:** Not applicable  
**UPPER:** Not applicable

**NFPA RATING: HEALTH ( ) FIRE ( ) REACTIVITY ( )**  
No NFPA rating (Does not apply to exposure hazards other than a fire)

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Firefighters should wear self-contained breathing apparatus in the positive pressure mode with a full faceplate when there is a possibility of exposure to smoke, fumes or hazardous decomposition products. The application of high velocity water will spread the burning surface layer. Finely ground EVAL® powder particles in the atmosphere are combustible and may be explosive. EVAL® resins may generate static electrical charges when conveyed or poured in an extremely dry environment.

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**SECTION VIII - REACTIVITY**

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**STABILITY:** Generally stable

**HAZARDOUS POLYMERIZATION:** Not likely

**CONDITIONS AND MATERIALS TO AVOID:** Extreme heat above 460F (238°C)

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition products may include Acetaldehyde, Crotonaldehyde, Acetone, Acetic Acid, Carbon Monoxide, Carbon Dioxide, Hydrocarbons, and other organic vapors.

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**SECTION IX - EMPLOYEE PROTECTION**

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**CONTROL MEASURES:** Provide adequate local exhaust ventilation to maintain air concentration of dust, fumes and vapors below acceptable exposure criteria (Sections II & IV). Provide adequate mechanical ventilation at the points of extrusion where polymer is at elevated temperatures coming from the extruder.

**RESPIRATORY PROTECTION:** Where exposure is likely to exceed acceptable criteria (Sections II & IV), use NIOSH/MSHA approved respiratory protection equipment. Respirators should be selected based on the form and concentration of contaminant in air in accordance with OSHA 29 CFR§ 1910.134.

**PROTECTIVE CLOTHING:** Wear heat protective gloves and clothing if there is a potential contact with heated materials.

**EYE PROTECTION:** Wear safety glasses meeting the specifications of ANSI standard Z87.1 where no contact with eye is anticipated. Chemical safety goggles meeting ANSI standard Z87.1 should be worn if there is a possibility of eye contact.

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## SECTION X - ENVIRONMENTAL PROTECTION

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**ENVIRONMENTAL PRECAUTIONS:** Avoid uncontrolled releases of this material. Where spills are possible, a comprehensive spill release response plan should be developed and implemented. If materials enters a water course or sewer, advise proper authorities of possible non-floating polymer.

**SPILL OR LEAK PROCEDURES:** Normal procedures for clean-up. Use good housekeeping practices. Wear appropriate respiratory protection and protective clothing as described in Section IX. Contain spilled material. Transfer to secure containers. In the event of an uncontrolled release of this material, the user should determine if the release of this material is reportable under applicable laws and regulations.

**WASTE DISPOSAL:** All recovered material should be disposed of or reclaimed in conformance with applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.

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## SECTION XI - REGULATORY CONTROLS

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### DEPARTMENT OF TRANSPORTATION:

DOT CLASSIFICATION: Non-Regulated Commodity

DOT PROPER SHIPPING NAME: Not applicable

OTHER DOT INFORMATION: Not applicable

### OTHER REGULATORY REQUIREMENTS:

#### Toxic Substance Control Act (TSCA)

This product is listed in the TSCA Inventory of Chemical Substances as Ethylene-vinyl acetate-vinyl alcohol copolymer.

The CAS RN Number is 26221-27-2.

#### Superfund Amendments and Reauthorization Act (SARA)

This material is not considered hazardous pursuant to Title III of SARA and is not considered subject to the annual reporting requirements specified by Section 312 and 313 of Title III of SARA and 40 CFR Part 372.

#### Coalition of Northeastern Governors (CONEG)

This product conforms to the CONEG regulations, indicating that the total weight of the heavy metals; lead, mercury, cadmium and hexavalent chromium in combined amounts is less than 100 ppm (by weight).

#### Ozone Depleting Chemicals (ODC)

Neither Freon nor other ozone depleting chemicals (ODC's) are used in manufacturing our EVAL® materials. Therefore, a warning label is not necessary to be on those products made of our EVAL® materials, as proposed by EPA under Federal Register (57 FR 19166) dated May 4, 1992.

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The Safe Drinking Water and Toxic Enforcement Act of 1986 (California PROP 65)

This product does not contain, at any level, the substances on the Hazardous Chemical List under the California Safe Drinking Water and Toxic Enforcement Act of 1986(Prop 65).

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**SECTION XII - PRECAUTIONS: HANDLING, STORAGE AND USAGE**

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When handling finely ground EVAL® powder, ground transfer, blending and dust collecting equipment to prevent static sparks. Remove all ignition sources from material handling, transfer and processing areas where dust may be present. Mechanical and local exhaust should be provided in work areas. Do not use near open flame or areas where smoking is permitted. EVAL® pellets spilled on walking surfaces constitute a slipping hazard. Work areas should be kept clean and free of pellets.

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The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which EVAL Company of America bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

PREPARED BY EVAL COMPANY OF AMERICA  
SUPERSEDES ALL OTHER EVALCA MSDS

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EVALCA****HOW TO USE  
EVAL RESINS****BARRIER  
PROPERTIES****PRODUCT  
DATA SHEETS****MATERIAL SAFETY  
DATA SHEETS**

## The Leader in Barrier Resin Technology

- EVAL® resins are characterized by their outstanding gas barrier properties, resistance to solvents, chemicals and hydrocarbons and excellent barrier to odor and flavor permeance. The key to this balance ... (more)
- EVALCA has developed a wealth of information on its EVAL® resins to assist you in designing high barrier plastic packaging. This site features [Product Data Sheets](#) and [Material Safety Data Sheets](#) for your convenience.
- Not sure if EVAL® resins are right for your particular packaging application needs? EVALCA is committed to strong technical support and application development. For further information, send your comments and questions to EVALCA.

Also, be sure to view our "New Developments" section for revolutionary product info.



**EVAL® Barrier Resins & Films  
for Packaging Applications.**

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